

New and noteworthy records of birds from the Sierra Nevada de Santa Marta region, north-eastern Colombia

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The Sierra Nevada de Santa Marta is an isolated pyramid-shaped massif on the Caribbean coast of north-east Colombia close to the border with Venezuela. The twin snow-covered peaks, Pico Simon Bolivar and Pico Cristobal, reaching an altitude of 5,775 m just 46 km from the Caribbean coast, represent the world's highest coastal massif. Because of its altitudinal variation as well as its location, the region contains a mosaic of globally significant biomes (nearly all those to be found in tropical America) from mangroves, semi-deserts, tropical dry forests and tropical wet forests, montane forests and páramos; the region is unique for its small size (c.11,000 km²) combined with its large variety of habitats.

Recent studies by the authors during July 1999 to January 2003 on the biogeography and conservation of the avifauna within the Sierra Nevada de Santa Marta Endemic Bird Area (EBA 036) (Stattersfield *et al.* 1998) and the adjacent lowlands, including the Ciénaga Grande wetlands, has yielded noteworthy distributional records of 20 bird species, with one species new to Colombia, new registrations for the Caribbean and Sierra Nevada region, and noteworthy altitude extensions for 26 bird species. All 20 bird species with new distributional records were not recorded by Todd & Carriker (1922), who amassed intensive ornithological collections at the beginning of the 20th century over a period of several years and at different sites and elevations within the Sierra Nevada area. Following the latter study no other intensive investigations took place, and information on the avifauna of the Sierra Nevada was principally collected along the San Lorenzo Ridge in the vicinity of Santa Marta city.

Much of the information included in this paper results from avifaunal surveys within the study areas of the San Salvador Valley and Toribio Valley on the northern slope of the massif, concentrated at elevations below 2,000 m. The Toribio Valley (localities Haciendas El Recuerdo, Cincinati, Vista Nieve) encompasses humid montane and premontane forest, and tropical humid forest, in the lower valley. Below 500 m very little forest persists, as the land is intensively farmed and used for cattle grazing. At 500–1,800 m, the valley represents a mosaic of humid premontane forest fragments, shade-coffee plantations and pasture. Above 1,800 m still-larger forest fragments exist up to the San Lorenz ridge. The San Salvador Valley is characterized by extensive primary forests along an altitudinal gradient of 600 to 2,300 m, and isolated forest patches and secondary forest at elevations from sea level to 600 m (Strewe in press, a). Additionally, excursions were made

to the western and southern slopes of the massif and to the National Parks Tayrona and Isla de Salamanca within the coastal region, where boreal migratory bird species in particular were monitored.

Data were collected during fieldwork within the project 'Habitat conservation of migratory and resident bird species in the Sierra Nevada de Santa Marta', conducted in 2000–2003 (Salazar & Strewe unpubl.). Study areas were visited monthly during excursions of 5–10 days. Bird populations were monitored using standardised methodologies for assessing bird population abundance (mist-netting [15x12 m], fixed-radius point counts, non-systematic field observations and tape-recordings). Birds were measured, photographed and selectively marked with colour rings. Tape-recordings, using a Sony TCM 5000 EV and Sennheiser ME66 microphone, were made on most days; copies of recordings have been deposited at Banco de Sonidos Animales (BSA), Alexander von Humboldt Institute, Bogotá.

The majority of records included herein were obtained at ten localities (Fig. 1):

- (1) San Salvador Valley, located on the northern slope of the Sierra Nevada de Santa Marta, department of La Guajira (11°05'N, 73°35'W; 8,400 ha), including Buena Vista nature reserve (450 ha), which protects premontane forest at 600–2,300 m (Strewe in press, a).
- (2) El Recuerdo (11°07'N, 74°06'W), Cincinati (11°06'N, 74°05'W) and (3) Vista Nieve (11°05'N, 74°05'W), three private coffee farms in the foothills of the San Lorenzo ridge within the Toribio Valley (600–1,900 m), including wet premontane forest and shade-coffee plantations.
- (4) San Lorenzo ridge (11°45'N, 78°58'W) in the vicinity of Santa Marta city includes wet premontane and montane forest at 1,800 to 2,800 m; primary forest still exists on the slopes of the ridge, whilst secondary forest and pine plantations dominate in the vicinity of the National Park Unit station and the military base.
- (5) Tayrona National Park (11°18'N, 73°56'W), protecting c.15,000 ha of mangroves, dry tropical to humid tropical forest at sea level to 600 m. The park area includes disturbed and secondary habitats in the lower and plain sectors, and primary forest on the slopes and ridges.
- (6) Los Besotes (10°31'N, 72°16'E), private nature reserve (450 ha), first-designated Colombian Important Bird Area (IBA) on the southern slope of the Sierra Nevada de Santa Marta, department Cesar c. 20 km north-east of the capital Valledupar, protecting primary forest at 300–2,000 m.
- (7) El Congo (10°59'N, 74°04'W), nature reserve of Fundación Pro-Sierra Nevada (40 ha) on the western slope of the Sierra Nevada mountains protecting premontane forest at 600–1,050 m. At 500–1,800 m, the valley represents a mosaic of humid premontane forest fragments, shade-coffee plantations and pasture; above 1,800 m still-larger forest fragments exist (Strewe in press, b).
- (8) Filo Cartagena (11°06'N, 73°69'W; 850 m) and (9) Alto de Mira (11°05'N, 73°56'W; 950 m), ecological stations at the limits of the Sierra Nevada de Santa Marta National Park within premontane forest. Primary forest around these



Figure 1. Map showing the geographical locations of the Sierra Nevada de Santa Marta region. (1) Buena Vista nature reserve, San Salvador Valley, (2) El Recuerdo, (3) Vista Nieve, (4) San Lorenzo, (5) Tayrona National Park, (6) Los Besotes nature reserve, (7) El Congo nature reserve, (8) Filo Cartagena, (9) Alto de Mira, (10) Isla de Salamanca.

stations was visited only a few times, because of problems with working permits from indigenous communities in the area.

- (10) Isla de Salamanca ($10^{\circ}59'$, $74^{\circ}32'$ W) National Park (54,000 ha), limited in the west by the Magdalena river, the Caribbean Sea in the north and the Ciénaga Grande de Santa Marta, Colombia's largest lagoon and Biosphere and RAMSAR reserve, in the south. The National Park is protecting coastal lagoons and nearly undisturbed mangroves.

Species accounts

GREY TINAMOU *Tinamus tao*

This tinamou is rare and local in humid forest, principally in foothills; known from the Perijá Mountains and the upper Cesar Valley near Fonseca (Hilty 2002, Hilty & Brown 1986), where heavy destruction of the natural habitats has occurred (pers.

obs.). Individuals were heard at 2,100 and 2,400 m at San Lorenzo ridge in January 2003 (tape-recording), representing an altitudinal extension from 1,900 m (Hilty 2002, Hilty & Brown 1986). P. Coopmans registered the species at the same locality (*in litt.*).

BARE-THROATED TIGER-HERON *Tigrisoma mexicanum*

Known in Colombia from the extreme north-west in the lower Atrato and the Gulf of Urabá region (Hilty & Brown 1986). The observation of an adult (photo) at a mangrove border at Los Cocos, Isla de Salamanca National Park, on 15 October 2002, signifies a range extension of 410 km north-west.

SWALLOW-TAILED KITE *Elanoides forficatus*

The species is distributed throughout Colombia, except the dry Caribbean region from department Atlántico eastward (Hilty & Brown 1986). Within the study area individuals or small groups were recorded frequently across study sites from the period March to May, which may indicate that these were transients from Central America (Ferguson-Lees & Christie 2001, Hilty 2002, Hilty & Brown 1986).

BLACK-AND-WHITE HAWK-EAGLE *Spizastur melanoleucos*

This little-known raptor is patchily distributed across Colombia with only a handful of records in humid and wet forest. The closest geographical records are 150 km distant on the western slope of Serranía de Perijá and Río Cesar valley (departments of Guajirá and Cesar), with a recent record from the Serranía de San Lucas (Hilty & Brown 1986, Salaman *et al.* 2002). The species was discovered for the Sierra Nevada region within the upper San Salvador Valley. Observations of individuals within the Buena Vista nature reserve occurred on 8 July 2000, with an adult perching in an open canopy of premontane forest at 450 m, on 19 September 2000, an adult soaring at 1,200 m, and on 18 April 2001, with close views of an adult soaring over primary premontane forest at 800 m.

AMERICAN GOLDEN PLOVER *Pluvialis dominica*

An uncommon transient in Venezuela and Colombia with few spring records, at Buenaventura Bay in February 1984 and in April 1977 east Vichada (Hilty & Brown 1986, Hilty 2002). On 8 April 2001 three individuals were observed migrating north along a ridge at 3,800 m within the upper río Frio Valley.

PEARLY-BREASTED CUCKOO *Coccyzus euleri*

The species is distributed very locally in sandy-belt woodland, scrub and gallery forest in Suriname, Guyana, south-east Peru, east and south Brazil, and northern Argentina. It is known from one record on the Caribbean coast near Cartagena in January (del Hoyo *et al.* 1997, Hilty & Brown 1986). The new records for the study area come from the Tayrona National Park, sector Neguanje, in tropical dry forest, where an adult was observed at close range for several minutes on 1 May 1997, and

230 km from Cartagena, in the southern foothills of the Sierra Nevada Mountains, at 300 m within the Los Besotes nature reserve, where another adult was found in tropical dry forest on 23 May 2001 (observation with Bernabé Lopez-Lanus). The status and even the general distribution of this scarce cuckoo remain very poorly understood.

MANGROVE CUCKOO *Coccyzus minor*

This rare cuckoo is known from 'Bogotá' skins presumably from Colombia (Hilty & Brown 1986). In Venezuela the species is rare, with two specimens from Capure, northern Delta Amacuro (1966) and additional observations exist in Red Mangroves *Rhizophora mangle* at Caño Macareo, Delta Amacuro and from Islas Los Roques in June 1988 (del Hoyo *et al.* 1997, Hilty 2002). On 21 November 2002 two individuals were observed along the Santa Marta–Barranquilla road at a mangrove border within the Isla de Salamanca National Park (photo). Both individuals stayed low in Red Mangroves and vocalized a very nasal *aan aan aan aan aan urmm urmm*, slightly accelerating, with the last two notes lower and longer (per Sibley 2001).

COMMON POTOO *Nyctibius griseus*

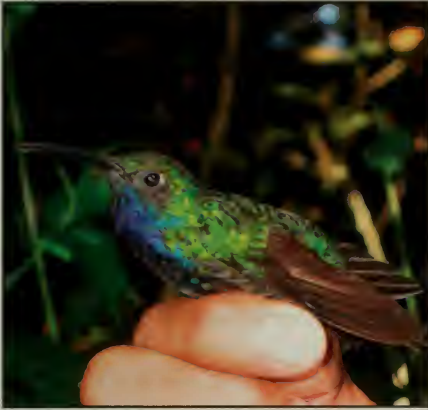
The species is distributed patchily throughout Colombia, but without definite records from Santa Marta and the arid Caribbean region (del Hoyo *et al.* 1997, Hilty & Brown 1986). The first registrations for the Santa Marta region come from the Caribbean plain with a nest reported by locals at Casa Loma nature reserve, in April 1999, individuals calling at San Salvador Valley (250 m) on 10 March 2000, and at Vista Nieve (1,000 m) on 30 January 2003 (tape-recording).

CHESTNUT-COLLARED SWIFT *Cypseloides rutilus*

Known from all three Cordilleras and Serranía de San Lucas, but unrecorded in the Santa Marta or Perijá Mountains (Hilty 2002, Hilty & Brown 1986). Within the study area the species is not uncommon, with 22 registrations at elevations from sea level, at Rodadero, to 3,200 m in the río Frío Valley (altitudinal range extension from 600 m for Colombia; del Hoyo *et al.* 1999 mention records down to sea level). Additional records were of groups with up to 30 individuals from the San Lorenzo ridge at 2,800 m (tape-recording), from Cincinati and Vista Nieve (1,200 m), from the San Salvador Valley (100–800 m) and from El Congo on the western slope

Figure 2 (on opposite page). Some examples of poorly known and rarely photographed birds from north-east Colombia.

- a. Male Lazuline Sabrewing *Campylopterus falcatus* (Ralf Strewe)
- b. Male Scaled Piculet *Picumnus squamulatus* (Ralf Strewe)
- c. Ruddy Woodcreeper *Dendrocincla homochroa* (Ralf Strewe)
- d. Zeledon's Tyrannulet *Phyllomyias zeledoni* (Ralf Strewe)
- e. Male Coppery Emerald *Chlorostilbon russatus* (Ralf Strewe)
- f. Female Rosy Thrush-tanager *Rhodinocichla rosea* (Ralf Strewe)



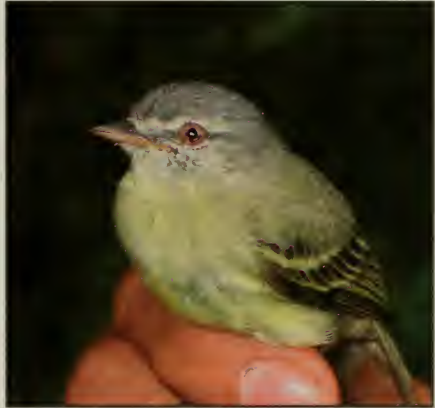
a



b



c



d



e



f

(1,000 m). In June 2001 the presence of this species in Perijá Mountains was also confirmed at Cerro Pintado, La Guajira (pers. obs.).

GREY-RUMPED SWIFT *Chaetura cinereiventris*

Records for this species in northern Colombia are from the northern foothills of the West and Central Andes, in Antioquia and recently from both flanks of the Serranía de San Lucas (Hilty & Brown 1986, Salaman *et al.* 2002). An adult was caught at 850 m at Filo Cartagena on the northern slope in October 2000 (photo), representing the first record for the Caribbean region and Sierra Nevada Mountains. Additionally, the species was observed at El Congo with two individuals on 29 November 2000, in the río Frío Valley at 1,400 m in April 2001 and three times at El Recuerdo in September and October 2002.

LESSER SWALLOW-TAILED SWIFT *Panyptila cayenensis*

This swift is little known in Colombia with only one previous Central Cordillera record in Caldas, in the mid-Magdalena valley, and a pair observed in the Serranía de San Lucas in March 2001 (Hilty & Brown 1986, Salaman *et al.* 2002). In Venezuela the species is recorded below 1,000 m at the base of both slopes of the Andes in Táchira and Mérida, but not from the Perijá Mountains (Hilty 2002). New distributional records of the species come from the Tayrona National Park, at Calabazo (150 m) in January 2001, from El Recuerdo (800 m), from Vista Nieve (1,300 m) with four individuals in November 2002 (tape-recording), from Filo Cartagena (850 m) with ten individuals in October 2000, and from the San Salvador Valley (600 m), where a group of 22 individuals was registered in November 2000 and three nests found in December 2002 (photo). These nests were at 8–15 m from the ground on heavy tree trunks at forest borders or within natural clearings (elevations 400–700 m).

LAZULINE SABREWING *Campylopterus falcatus*

The species is distributed locally and uncommonly in humid forest, forest borders and shady plantations on both slopes of the East Andes, including the Perijá Mountains as the nearest population to the study area (Hilty & Brown 1986, Hilty 2002), where during an excursion to the Cerro Pintado (department of Cesar), two leks at 1,800 and 2,200 m were found in primary montane forest in June 2001 (tape-recording). New registrations for the study area come from four different sites on the northern slope of the Sierra Nevada, spanning the whole study period. Twenty-three individuals were caught, including males (Fig. 2a), females and juveniles between 450 to 1,200 m in the San Salvador Valley, at Filo Cartagena (800 m) in October 2000, at El Recuerdo (800 m) and at Vista Nieve (1,600 m) in July and October 2002. An active lek of five males was recorded at Vista Nieve within premontane forest at 1,300 m in June 2002. This lek is close to a main trail at a distance of only 1.2 km from the cabin,

where the collector M.A. Carriker lived and collected intensively in previous years (Todd & Carriker 1922). It is highly unlikely that he would have failed to encounter the lek of this species so close to his home. The recent records of the species are very interesting and raise the question, how and when did the species reach the northern slope of the Sierra Nevada massif from its original distribution on the west slope of the Perijá Mountains, where most of the species' habitats have been destroyed (pers. obs. June 2001).

SCALED PICULET *Picumnus squamulatus*

The species is known from the base of the Sierra de Perijá in Venezuela, but is not recorded from the base of the same mountains in Colombia. An isolated record exists from the south end of the Santa Marta range (Hilty 2002, Hilty & Brown 1986). Within the study period the species was observed several times in shade-coffee plantations at 1,100 m at Vista Nieve, and once at a forest border at 900 m at El Congo on the western slope. Captures were made at El Recuerdo (800 m), with an adult male on 26 September 2002 (Fig. 2b), and from Alto de Mira, with a female in January 1995 (M. Alvarez *in litt.*). The captured adult male, and also adult males seen in the field, showed yellow forecrown spots. Males of the race *roehli*, recorded from the southern slope of the Santa Marta range and north Venezuela, have red forecrown spots, sometimes yellow or orange. The race *lovejoyi* (extreme north-west Venezuela, department Zulia) is similar, but the forecrown spots of males are always yellow instead of red (del Hoyo *et al.* 2002). Following del Hoyo *et al.* (2002) the individuals from the northern slope of the Sierra Nevada Mountains are of the *lovejoyi* type, as all males showed clear yellow forecrown spots and greyer upperparts, representing the first records of this subspecies in Colombia.

RUDDY WOODCREEPER *Dendrocincla homochroa*

Only few Colombian records exist of this rare treehunter, including from both slopes of the Perijá Mountains and two records from humid forest in foothills on the east slope of the Santa Marta range in the department of Guajira (La Cueva, Los Gorros) (Hilty 2002, Hilty & Brown 1986). The species is common on the northern and north-western slope of the massif, with a total of 57 individuals caught in the San Salvador Valley (250–650 m), Alto de Mira (1,200 m) in December 1995 (Alvarez *in litt.*), El Recuerdo (800 m) and Vista Nieve at 1,600 m (Fig. 2c). This represents an altitudinal range extension from 1,250 m (Hilty 2002, Stotz *et al.* 1996), and range extension across the entire massif (85 km). The species is an indicator for premontane forest in good condition, as it was never registered in disturbed or secondary forest within the study area. Hilty (2002) noted that the species was fairly common formerly, but is declining because of forest clearance within its small Venezuelan range. Knowledge of its limited distribution is important given that it is vulnerable to premontane forest destruction in northern Colombia.

ZELEDON'S TYRANNULET *Phyllomyias zeledoni*

The species is very uncommon and locally distributed between 470 to 1,800 m in Venezuela, including the Sierra de Perijá (1,640 m), on Cerro Pejochaina. In Colombia few records exist in humid foothill forest in Meta and in west Caquetá (Hilty 2002, Hilty & Brown 1986). The first record for northern Colombia comes from El Recuerdo (800 m), where an adult was caught at a forest border on 18 October 2002 (Fig. 2d). The individual had light reddish-brown eyes, a pinkish-orange bill below, the typical greyish crown of the subspecies *wetmorei*, two narrow pale yellowish wingbars, a sharp white eyebrow, the chest flammulated yellowish olive and very characteristic spiny tarsi.

PINE WARBLER *Dendroica pinus*

The first record for Colombia and South America comes from Vista Nieve (Curson *et al.* 1994, Rodner *et al.* 2000), where a first-year female was observed intensively by the authors and S. Restrepo at 1,050 m on 20 November 2002. The individual was studied using the Sibley (2001) guide over 10 minutes in optimal light and at a distance of less than 15 m, showing a pale neck patch, dark cheeks, white spectacles, blurry streaks on the sides of the breast, white undertail-coverts and a long tail projection. The bird was feeding in the low canopy of an *Inga* tree (8 m) within a shade-coffee plantation, following a mixed-species flock, including Blackburnian Warbler *Dendroica fusca* and Tennessee Warbler *Vermivora peregrina*.

YELLOW-THROATED WARBLER *Dendroica dominica*

The species is known in South America from a sighting at Barranquilla in December 1969 and at Guira Wash, south of Santa Marta, in October 1971 (Hilty & Brown 1986). The third record for South America is from the San Lorenzo ridge, where an adult male was observed at the border of an exotic pine plantation at 2,200 m on 20 February 2003. The species was accompanying a flock of resident species, together with Blackburnian Warbler and Tennessee Warbler. The observation was made in good light and at close distance (identification made using Sibley 2001).

CHESTNUT-SIDED WARBLER *Dendroica pensylvanica*

Three Colombian records exist for this warbler, from Tolima (October), Santander (November) and south of Cali in the Cauca Valley (November) (Hilty & Brown 1986). New records for the Caribbean region come from the San Salvador Valley, where an adult male was observed at a forest border (150 m) on 3 February 2001 and an adult female at 250 m on 17 March 2001. During an excursion to the adjacent Palomino River Valley another female was encountered in the canopy of a flowering *Anacardium* tree at 50 m on 22 February 2001. Other observations of singletons come from Tayrona National Park (eastern side) and along the Santa Marta- Ciénaga road in October 1994 (Paul Salaman *in litt.*)

FULVOUS-HEADED TANAGER *Thlypopsis fulviceps*

The species is known in Colombia from the Sierra de Perijá (to 1,900 m in June 2001, pers obs.) and from the Eastern Cordillera in Norte de Santander (Hilty & Brown 1986, Isler & Isler 1999). In Venezuela the species is uncommon at 800–1,900 m in the Sierra de Perijá (subspecies *obscuriceps*) (Hilty 2002). On 19 April 2001 two individuals were observed accompanying mixed-species flocks at 2,050 m and 2,380 m at premontane forest borders within the upper río Frío Valley, on the western slope of the Sierra Nevada massif (photo), representing a 120-km range extension.

SOOTY GRASSQUIT *Tiaris fuliginosa*

Known in Colombia from the upper Magdalena and upper río Patía valleys (Hilty & Brown 1986). In Venezuela it is recorded between 800–1,700 m in the Sierra de Perijá, where it is apparently local or seasonal in dry grassy scrub, along borders of moist and humid woodland or at grassy openings in lighter woodland (Hilty 2002). Within the study area, in total 62 individuals (males, females and juveniles) were caught at different localities, at Alto de Mira (M. Alvarez *in litt.*), within the San Salvador Valley at 250 and 450 m, El Recuerdo (800 m), Vista Nieve (1,600 m), and El Congo (850 m), representing a significant range extension and the first recording of the *zuliae* subspecies for Colombia. A nest was found at El Congo in January 2002 (photo).

Additional significant altitudinal extensions

Noteworthy altitude extensions registered during the study period are listed for 26 bird species below; the maximum or minimum elevation for each species, based on data in Fjeldså & Krabbe (1990), Hilty (2002), Hilty & Brown (1986), Renjifo *et al.* (2002), Ridgely & Greenfield (2001) and other recent publications, is followed by the new altitude extension and the locality.

SEMICOLLARED HAWK *Accipiter collaris* in Andes to 2,200 m (Ferguson-Lees & Christie 2001), from 1,800 m to 2,400 m at San Lorenzo ridge.

ZONE-TAILED HAWK *Buteo albonotatus* in Venezuela to 600 m (Hilty 2002), from 500 m to 800 m in San Salvador Valley.

BAND-TAILED GUAN *Penelope argyrotis* in Venezuela in Coastal Cordillera down to 300 m (Hilty 2002), from 900 m down to 350 m in San Salvador Valley.

BLACK-FRONTED WOOD-QUAIL *Odontophorus atrifrons* in Venezuela at 1,650–3,100 m (Hilty 2002), from 1,200 m to 700 m at El Congo.

SANTA MARTA PARAKEET *Pyrrhura viridicata* from 2,000 m (Hilty & Brown 1986) to 3,200 m at río Frío.

COPPERY EMERALD *Chlorstilbon russatus* at 500 m (del Hoyo *et al.* 1999) down to 250 m at Cerro Boliche, Santa Marta (Fig. 2e).

WHITE-TAILED STARFRONTLET *Coeligena phalerata* from 1,400 m (del Hoyo *et al.* 1999) down to 1,200 m in the San Salvador Valley.

SANTA MARTA WOODSTAR *Chaetocercus astreans* from 825 m (del Hoyo *et al.* 1999) down to 350 m in the San Salvador Valley.

YELLOW-BILLED TOUCANET *Aulacorhynchus calorhynchus* in Venezuela down to 900 m (Hilty 2002), from 600 m down to 350 m in the San Salvador Valley.

KEEL-BILLED TOUCAN *Ramphastos sulfuratus* from 1,600 m (del Hoyo *et al.* 2002) to 1,900 m at San Lorenzo.

COCOA WOODCREEPER *Xiphorhynchus susurrans* down to 1,800 m in Venezuela (Hilty 2002), from 1,100 m to 1,600 m at Vista Nieve.

STREAK-CAPPED SPINETAIL *Cranioleuca hellmayri* from 1,600 m (Stattersfield *et al.* 1998) down to 1,200 m in the San Salvador Valley.

MONTANE FOLIAGE-GLANER *Anabacerthia striaticollis* 900–2,300 m in Venezuela (Hilty 2002), from 1,000 m down to 600 m in the San Salvador Valley.

SANTA MARTA WHITE-CROWNED TAPACULO *Scytalopus sanctaemartae* from 1,350 m (Stattersfield *et al.* 1998) down to 600 m in the San Salvador Valley.

BROWN-RUMPED TAPACULO *Scytalopus latebricola* from 2,150 m (Stotz *et al.* 1996) down to 1,900 m on the San Lorenzo ridge.

GOLDEN-BREASTED FRUITEATER *Pipreola aureopectus* down to 800 m in the Coastal Cordillera in Venezuela (Hilty 2002), from 1,300 m down to 600 m in the San Salvador Valley.

MOUNTAIN ELAENIA *Elaenia frantzii* down to 1,200 m in Venezuela (Hilty 2002), from 900 m down to 600 m in the San Salvador Valley.

BLACK-CHESTED JAY *Cyanocorax affinis* to 1,700 m in Venezuela (Hilty 2002), from 2,200 m to 2,600 m at San Lorenzo.

YELLOW-LEGGED THRUSH *Platycichla flavipes* at 100 m on Isla Margarita in Venezuela (Hilty 2002), from 600 m down to 350 m in the San Salvador Valley.

BLACK-HOODED THRUSH *Turdus olivater* 800 m in Venezuela (Hilty 2002), from 1,200 m down to 600 m in the San Salvador Valley.

BROWN-CAPPED VIREO *Vireo leucophrys* 700 m in Venezuela (Hilty 2002), from 1,200 m down to 500 m in the San Salvador Valley.

WHITE-LORED WARBLER *Basileuterus conspicillatus* from 750 m (Stattersfield *et al.* 1998) down to 450 m in the San Salvador Valley.

WHITE-SIDED FLOWERPIERCER *Diglossa albilatera* from 1,300 m (Hilty 2002) down to 1,200 m in the San Salvador Valley.

SANTA MARTA MOUNTAIN-TANAGER *Anisognathus melanogenys* from 1,500 m (Isler & Isler 1999) down to 1,200 m in the San Salvador Valley.

ROSY THRUSH-TANAGER *Rhodinocichla rosea* up to 100 m in Venezuela (Hilty 2002), from 500 m down to 100 m at Tayrona (Fig. 2f).

SLATY FINCH *Haplospiza rustica* occasionally to 1,000 m in Andes (Stotz *et al.* 1996), from 1,200 m down to 800 m at El Recuerdo.

Discussion

The Sierra Nevada de Santa Marta justifiably receives wide international recognition for its importance as an unique and highly threatened enclave for native and migrant avifauna. The massif represents the world's single-most important continental avian centre of endemism with 18 endemic species and 55 endemic subspecies, and is a highly strategic staging post for Neotropical migrant bird species travelling from the Caribbean to South America.

A total of 673 bird species, including the new records presented here, have been registered in the Sierra Nevada de Santa Marta region (Strewe unpubl.). Additions are expected from records of boreal migrants and from the invasion of non-forest species as forest destruction continues. The southern slope is particularly poorly studied and investigations are urgently needed there, considering that more than 90% of the natural habitats have been destroyed. Security problems, as in many other localities of the region, make access to the southern slope very difficult.

The páramo region of the massif and its avifauna is practically unknown, with historical collections by Carriker (reported in Todd & Carriker 1922) and one short excursion within the río Frio valley in April 2001 (Strewe in press, b). The páramo lies entirely within the indigenous reserves and excursions require permits from the indigenous organizations. Indications are that páramo habitats and the forest-páramo ecotone are threatened through seasonal burning and grazing. Ongoing destruction of these natural habitats is threatening especially the endemics with limited ranges.

low population densities and naturally localised distributions resulting from specific habitat preferences. Monitoring of the páramo habitats, their avifauna and of anthropogenic impacts on the ecosystem are of critical importance.

Within the massif less than 15 % of the original forest cover remains, and despite substantive protection status on paper, the massif continues to sustain high rates of habitat loss to human colonisation and degradation. Yet little attention or effort has been taken within the last 50 years towards conducting research to aid the implementation of effective conservation measures and adequate management strategies for this highly sensitive faunal group.

Data collected during fieldwork within the present project are being used to develop habitat management strategies, addressing identified threats to migrant and resident birds, and to implement conservation corridors and a network of private reserves. Other project objectives are to commercially produce bird-friendly coffee, and to establish an educational programme involving local communities in nature conservation and sustainable agronomy. As a result of the project activities, the río Frío, San Salvador and Toribio Valleys are declared as Important Bird Areas (IBA), under a joint BirdLife International and Alexander von Humboldt Institute (Bogotá) programme.

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A survey of the Serranía de Jungurudó, an isolated mountain range in eastern Panama

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Eastern Panama is a well-known centre of endemism for birds. In a recent analysis by BirdLife International, Stattersfield *et al.* (1998) examined the distribution of restricted-range birds (those with a total world range of less than 20,000 km²) and defined 218 Endemic Bird Areas (EBAs), based on the co-occurrence in a given area of two or more of such species. Eastern Panama includes parts of two of these EBAs.

The Darién Highlands EBA is defined as the highlands of eastern Panama and westernmost Colombia above 700 m. Eleven restricted-range species are entirely confined to it, with another five found both there and in other EBAs. The Darién Lowlands EBA includes the lowlands and foothills of eastern Panama and westernmost Colombia up to c. 1,000 m. It has four species entirely confined to it, with another nine found both there and in other areas (Stattersfield *et al.* 1998).